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RELATION OF TRADES-UNIONS TO APPRENTICES.*

As ONE of the chief causes of opposition to trades-unions is their supposed influence in limiting the number of apprentices, it is important to investigate the question as to the extent of this influence. Some previous studies of the subject are to be found in the reports of the bureaus of labor statistics of a few of our States.† The principal addition which the writer will now try to make to these bureau reports is drawn from the replies of a large number of trades-unions in this country having a national or international organization, and from personal interviews with such labor union leaders as Messrs. Strasser, Gompers, McGuire, and McNeil.

Before giving the result of these inquiries, it may be well to say a word of the change in apprenticeship brought about by modern changes in industry. The whole tendency of modern business methods towards the destruction of the entire apprenticeship system is proving too strong to be resisted. Trades become more and more subdivided. It becomes unprofitable for an employer to teach all parts of a business to a workman; while the latter, in view of the frequent changes in machinery and in business methods, stands more in need of general intelligence and manual dexterity than of a minute knowledge of each of the fifty or more subdivisions of an industry. Professor W. T. Harris once remarked, "Whereas formerly it required seven years to learn a trade, now one must be able to learn a new occupation in seven weeks."

Yet in some lines of work, such as the glass-working, iron-moulding, printing, and building trades, there is not now, and is not likely soon to be, enough subdivision and use of machinery to render special training unnecessary. Apprenticeship has until recently been considered by all to be the only means of securing this practical skill. It is in this gradually lessening number of trades, where apprenticeship is still practicable and necessary for good workmanship unless trade-schools can accomplish the same end, that some of our American trades-unions demand a thorough apprenticeship. In connection with rules which require that the apprentice must spend a certain number of years, usually three or four instead of seven as of old, in learning his trade, and which aim to protect both employer and apprentice during this time, our unions in some cases have other rules which restrict the proportion of apprentices to journeymen in each shop. It is this latter class of rules that have brought so much odium on labor organizations. What are the facts?

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*This paper was read before the American Social Science Association at its meeting, September, 1891.

†Notably, New York, 1886, New Jersey, 1887 and 1891 (in press), California, 1887-88, Wisconsin, 1887-88, Ohio, 1878, 1884, Missouri, 1888, Connecticut, 1890.

Of the 50 to 60 trades-unions in the United States having a national or international organization, 48 with a membership of over 500,000 have made returns to the writer. Most of the other unions are small or known to place no restrictions on apprentices. Of this 500,000, embracing the great body of organized labor in this country, outside of the Knights of Labor, only about 83,000 men in 17 unions, or 16½ per cent. of all, report any rules of the national body restricting apprentices; and only 71,000 men in 14 unions, or 14 per cent. of the 500,000, report success in the execution of their laws on the subject. The other three unions report comparative failure. It is well known that the Knights of Labor, in number 100,000 to 200,000, place almost no restriction on apprentices. Restriction is left to the locals in 10 of the trades-unions, with about 197,000 members, or 39 per cent., and is by no means attempted, or, if attempted, is often not carried out in all those locals. 21 unions, with over 222,000 members, or nearly 45 per cent., report that they have no restrictions whatever. These 21 unions, together with their membership, are presented in Table I.

TABLE I.

Name.	*Membership.*
International Furniture Workers' Union of America	Not reported
United Mine-workers of America	40,000
International Brotherhood of Boiler-makers and Iron Ship Builders	8,000
National Federation of Silk-workers	1,107
Locomotive Engineers	30,000
Boot and Shoe Workers' International Union	14,000
Granite Cutters' National Union (about)	15,000

TABLE I. — *Continued.*

Name.	*Membership.*
Locomotive Firemen	22,000
Brotherhood of Railway Trainmen	20,000
Switchmen's Mutual Aid Association of North America	11,500
Glass Employees' Association of America	450
Waiters' and Bar-tenders' National Union	Not reported
Building Laborers' Hod-carriers' Union	" "
Order of Railway Conductors	16,000
Amalgamated Association of Iron and Steel Workers *	27,000
Amalgamated Society of Engineers, Machinists, Millwrights, Smiths, and Pattern-makers (about)	2,000
National Federation of Silk-workers	
Cotton Mule Spinners of Fall River	800
Axe and Edge-tool Makers' National Union of America	
Amalgamated Society of Engineers (in United States about)	2,000
Journeymen Bakers' National Union	12,000
Total	221,857

It will be noticed that 100,000, or nearly half of the above, are railway employees, and 40,000 are mine-workers, where apprenticeship is impracticable. The secretary of the Glass Employees' Association of America, Mr. L. J. Fegan, writes from Pittsburg: —

> We have no restrictions other than that we require apprentices in piece-work establishments to receive the same price as journeymen. While the latter provision does no injustice to the employers, they not having to pay for work not performed, nevertheless it protects the workers to the extent that employers would prefer competent workers in preference to beginners. . . . If there are no restrictions, and the practice of putting in apprentices is customary, it has a tendency to reduce wages. When there are two or three men for one job, then the competition for positions becomes acute, and workers from necessity are compelled to accept any pay offered. In one branch of the packing industry in glass works (owing to lack of organization) it is a rare thing to see a man over thirty-five years of age. Young people are preferred, owing to their working cheaper and their superior activity. Young men learn the business, and about the time they have a family dependent upon them they are compelled to seek other employment for a livelihood.

We begin to see why so many trades-unions restrict the number of apprentices.

The 10 unions, with about 200,000 men, which abandon all regulations of apprentices to local organizations, are given in Table II.

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*The Boston branch has 1,800 members.

TABLE II.

Name of Union.	*Membership.*
Drillers' and Quarrymen's Union	4,200
International Machinists' Union of America	1,000
United Brotherhood of Carpenters and Joiners of America	83,000
International Typographical Union	27,800
Amalgamated Society of Carpenters and Joiners	35,000
Cigar-makers' International Union of America	24,624
Brotherhood of Painters and Decorators of America	15,000
Sheet-iron and Cornice Workers' International Association	3,000
Journeymen Stone-cutters' Association	3,000
International Brotherhood of Machinery Moulders of North America	
Total*	196,624

Only those branches of the cigar-makers' organization which make the better grade of cigars attempt any restriction at all of apprentices. Where restriction is attempted, it is usual to allow one apprentice to a shop, and two apprentices where from five to ten journeymen are employed. The term of apprenticeship being only three years and the natural working life of cigar-makers over fifteen years, there is in the application of this rule opportunity for a considerable yearly increase in the number of cigar-makers.

Of the 11 local Typographical Unions in New York State, investigated in 1886 by the New York Bureau of Labor Statistics, 8 reported some restriction of apprentices. The very moderate rule common to most of these was one apprentice to four or five journeymen, the term of learning being four years. But such rules are of comparatively little avail in keeping down the number of printers because of the large number trained in the country newspaper offices, where, in the absence of unions, no rules are applied. All the eleven unions, as stated in this report, admitted to their membership, on equal terms with any others, those boys that had learned their trades in non-union establishments.

The machinists seem to place no restriction upon apprentices; but the secretary of their union, Mr. Morse of Brooklyn, writes: —

> Personally, I must say that I very much deplore the present system of most of our large machine shops throughout this country. For instance, a boy goes into one of these large shops to serve an apprenticeship of three years. He goes in with the understanding, in many cases, that at

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*In 1887 the Bricklayers' and Masons' International Union (16,000 members) had rules placing them under this table. No later report has been received. This would make the total over 210,000.

> the end of that time he will be a finished mechanic, able to command the wages of such. Instead of dealing fairly with the boy and giving him a chance to get the first rudiments of the trade he has chosen,— for that is all I claim any boy does get during his apprenticeship, be his chance ever so good,— he is put at some machine or bench, as the case may be, and kept there for three years. Now, sir, I ask you, as an intelligent man, what on earth is that boy good for? Can we wonder at the number of tramp machinists — for that is what we call them in the trade — going about this country? It is a deplorable condition for our trade to be sinking into. Now, the remedy for this, to my mind, lies in the thorough organization of our trade. I do think there should be restrictions and rules regulating apprentices, and stringent ones, too. I am quite sure that our International Union will take up this matter at our next convention.

The Brotherhood of Painters and Decorators, with 15,000 members, has no national rules on apprenticeship, but recommends to the locals to secure the indenturing of apprentices for four years, and to limit the number as each local may see fit. But those recommendations are little heeded. The general secretary, Mr. J. F. Elliott, writes from Baltimore: —

> We desire to have an apprentice law that will re-establish the indenturing of apprentices and the turning out of skilled tradesmen; but the tendencies of the times point to a different condition, and the trade-school is gaining favor all over. Wherever our locals are strong enough we enforce our laws and endeavor to make the indenturing of apprentices the rule, but so far have met with poor success. I notice that the bosses are beginning to find that the rapid introducing into the market of a vast number of unskilled painters is affecting their interests, and that this element, not being able to hold positions as journeymen, opens up independent shops and takes work under any condition,— a matter which seriously affects the interests of the bosses.

Each local of the Sheet-iron and Cornice Workers' Union has its own rule, or absence of rule, on apprentices. The Pittsburg district now allows one apprentice every four years to three journeymen instead of to four as formerly.

In Table III. are given the three national unions that have some rules limiting the number of apprentices, but, according to their secretaries, fail to enforce them.

TABLE III.

Name of Union.	*Membership.*
Saddle and Harness Makers of America	1,500
Hat-makers' National Association of the United States	2,994
Shoe-lasters' Union	7,850
Total	12,344

The Hat-makers' National Association reports almost total failure in the enforcement of any limitation upon apprentices. The Shoe-lasters' Union has a stringent rule: "No branch of the organization shall give permission to or allow any of its members to instruct, teach, or in any way aid any person or persons in learning to last; except in case a member of said branch wishes his son to learn to last, which wish may be granted by said branch, should said branch conclude so to do. If said wish is granted, it shall then be lawful for any member of said branch to teach said son to last, if for good and sufficient reasons the father of said son is personally unable so to do." But, in justifying this rule as a necessary "protection against a surplus of labor in the trade," the secretary, Mr. Edward L. Daly of Boston, remarks that "the manufacturers teach more apprentices than their business requires." This remark, and facts of the shoe business known in a general way to the writer from frequent visits to the shoe towns of Massachusetts, lead him to believe that the rules of the Shoe-lasters' Union keep few, if any, who so desire from learning the trade. The Massachusetts census of 1885, the most complete census ever taken in any part of this country, reports 6,032 shoe-lasters in Massachusetts and only one apprentice,— a sufficient proof of the break-down of the restrictions of the Shoe-lasters' Union, for of course hundreds enter the trade yearly without formal apprenticeship.

The National Association of Saddle and Harness Makers of America report very poor success in enforcing their rule of one apprentice to a shop, one to the first six journeymen, and one to every ten additional journeymen. The secretary, Mr. George Joscelyn of Boston, makes the following valuable observations: —

> In the East and North we have no such thing as apprentices at all. The system largely prevails in the South and portions of the West, and, as practised, is of no practical benefit to the boys as far as acquiring skill in the business is considered, and is an injury to the trade at large by reason of the fact that, as soon as the boys get where they ought to have more pay for the work done, they are dropped, and a new boy taken on to go through the same routine. Thus an army of unskilled boys are turned loose every year who must live, and will work for any wage offered that will enable them to do so.

> The worst system that I know of prevails in the city of Baltimore, Maryland. A boy is put to work in charge of another boy, and works three years. Then he in turn is given from three to five more boys to instruct; and, as each completes his servitude, he takes up the rôle of instructor in his turn. The pay starts at $3.50 to $4 per week, and increases 50 cents each six months to the end of the three years, when it stops,— a request for more wages after that always resulting in a discharge.
>
> When you realize that, with good advantages, it takes a man not less than ten years to become a good general workman in the harness trade, — and many men do not acquire first-class skill even in that time,— the folly and injustice of the system are apparent.
>
> From a knowledge of the business gained by thirty-three years' experience I consider our restrictions as liberal; and, if strictly followed out, they would be a benefit to the boy who wished to learn and to the trade at large.

In Table IV. are given the membership and ratio allowed of apprentices to journeymen of those unions that claim to be quite successful in their efforts at restriction.

TABLE IV.

Name.	*Membership.*	*Length of Apprenticeship.*	*Ratio of Apprentices to Journeymen.*
American Flint Glass Workers' Union	7,300	4 years	1 to 4 or 5 or 7, according to the locality.
Bottle-blowers (Eastern division)	2,200	3 to 5 years	1 new apprentice each year to shop of 9 journeymen. If over 9 journeymen, 1 apprentice each year to every 15.
International Trade Association of Hat-finishers of America	4,154	3 years	1 to a department, except the "finishing."
Table-knife Grinders' Union	323	4 years	None but members' sons, and apparently not all of them.
German American Typographia (about)	1,100	4 years	1 to an office and 1 extra to every 6 journeymen.
Pattern-makers'Union	2,500	4 years	1 to 4, but not over 4 to a shop.
Iron-moulders' Union (about)	28,000	4 years	1 to a shop and 1 extra for every 8 journeymen.
Hat-makers' Protective Union of Philadelphia..............			No particulars given.
Amalgamated Association of Elastic Web-finishers	228		1 apprentice to 10 looms in England, but in U.S. immigrants and sons of workmen supply the trade.

TABLE IV.—*Continued.*

Name.	*Membership.*	*Length of Apprenticeship.*	*Ratio of Apprentices to Journeymen.*
Tack-makers' Union..	212		Members can train only their own sons by vote of union.
Horse-collar Makers' Union................	2,000	3 years	1 to a shop, or 1 to 7 journeymen, and not over 3 to a shop.
Journeymen Tailors' Union................	20,000	4 to 5 years	1 apprentice to 1 journeyman.
National Silk and Fur Hat Trimmers' Trade Association of America.............	663	4 years	1 to 10, or 1 to a shop.
International Woodcarvers' Association of North America...	1,400	3 years	1 to 5, but only 3 to a shop.
Wool Hat Finishers' Association of the United States.......	600 (in 1889)	3 years	1 to a shop, or 1 to 10.

Although some of the rules seem quite restrictive, there are not nearly so many apprentices as even these rules would permit. In Massachusetts—*e.g.*, in the hat business—there are 226 technically known as hatters and 29 apprentices. But there are 875 other hat-makers, such as silk and fur hat makers, finishers, trimmers, pressers, etc., and only 3 apprentices instead of fully thirty times that number, as the union rules allow. In this as in nearly every case, we find that the deathblow to apprenticeship is not struck by the unions, but by the employers, and by conditions of business which bring workers into a trade without any regular training or apprenticeship whatever.

Similarly there were in Massachusetts, according to the census of 1885, only 16 apprentices to 769 journeymen-pattern-makers, 1 to 48; 58 apprentices to 2,997 iron-moulders, or 1 to 51.7; and 16 apprentices to 408 wood-carvers, or 1 to 25.5. There were 133 apprentices to 1,624 journeymen tailors, or 1 to 12, and 455 apprentices to 4,116 printers and compositors, or 1 to 9. So that outside the two last there were not by a large number as many apprentices as the union rules allow.

It will be noticed that few returns appear from the building trades, due chiefly to the fact that many of these have only local and not national organization. A few of these are included in the report on apprentices of the California Bureau of Labor Statistics for 1887–88. The following from the report sufficiently summarizes it, and emphasizes the fact already brought out that comparatively few trades-unions make any pretence of restricting apprenticeship: —

> The following table shows that, out of forty-eight trade organizations, only fourteen, or less than one-third, have rules or regulations relating to apprentices or limiting their number. The bricklayers' is the first of these on the list. They limit the number to two apprentices to each master mason or employer, no matter how many mechanics he may have in his employ; and they must be the sons of bricklayers. Another rule they have is that "the right of any person to take an apprentice, except a master mason, will not be recognized by this association." Under this rule, it would appear that a journeyman bricklayer is not allowed to teach his trade to his own son, unless he could be one of the two allowed to the master mason who employs him. The caulkers' rule is still more stringent, as they allow only one to each employer. The cigar-makers limit the number to one to each shop and one to ten men; the glass-blowers, one to fifteen men; the pattern-makers, one to four; the iron-moulders, one to each shop and one to eight men; the coopers, one son to each member; the tailors, one to each member, regardless of relationship. The hatters allow two in every shop, and the stone-cutters the same number in every yard; and wood-carvers, one to a shop, and two if six or more men are employed.

In view of the common belief that the building trades are successful in limiting the number of apprentices, it is very significant to note the facts of the Massachusetts census as collated by the writer in Table No. V.

TABLE V.

Name of Trade.	*Number of Journeymen.*	*Number of Apprentices.*	*Ratio of Apprentices to Journeymen.*
Blacksmiths	5,550	196	1 to 28.3
Carpenters..............	21,042	340	1 to 62
Machinists..............	15,751	788	1 to 20
Masons	6,205	59	1 to 105
Painters (about)........	10,000	119	1 to 89
Plumbers...............	1,787	397	1 to 44
Printers................	8,824	455	1 to 19
Tinsmiths	1,822	112	1 to 16
All others in manufacturing and mechanical industries............	323,603	3,212	1 to 101

In the report for 1886 of the New York Bureau of Labor Statistics, 28 unions organized with 64 local branches were investigated. Only 8 unions, through 17 local branches, had any restriction on the number of apprentices.

In New Jersey, according to the Labor Bureau Report for 1887, 59 out of 150 trades-unions "regulated" apprentices, but by no means in all cases restricted their number. Often only the time and manner of training are regulated. Likewise 27 out of 178 local assemblies of the Knights of Labor regulated apprenticeship.

The New Jersey Report for 1891 shows that the glass-blowers, after a struggle of four years, have arranged with the majority of employers, including all who employ union men, to allow one new apprentice for fifteen journeymen, with a term of five years, thus allowing practically one apprentice for three journeymen, and apparently contemplating the doubling of the number of journeymen in about twenty years.

A member of the New Jersey Bureau, Mr. Joseph Fischer, writes under date September 21, 1891, that, aside from the glass-blowers, there has been no new development in the direction of apprenticeship during the last few years, "probably due to the fact that little progress has been made in organization. While trades-unions remain about the same numerically, the Knights of Labor order has very materially decreased in membership. A very pessimistic view seems to pervade workmen circles just now. I hear it frequently stated that in a few years, owing to the development of machinery, there will be no such thing as a skilled trade."

As a final proof of the failure of trades-unions in any considerable degree to restrict apprentices, reference may be made to the small number of strikes for this purpose. In 1881–86 inclusive, according to the United States Bureau of Labor Statistics for 1886, there were 22,344 strikes, and of these only 250, or 1.1 per cent., had any connection with apprentices. 63 of these were unsuccessful. Of these 250 strikes, 157 were in the building trades, 28 in glass, 15 in tobacco, 12 in clothing, 9 in metals, 7 in printing and publishing. Of the 9,384 strikes in New York 1885–89, as reported by the New York Bureau of Labor Statistics for 1889, only 114, or 1.2 per cent., were connected with apprenticeships. Of these 114, only 9, or 7.9 per cent., were successful, and 9 were partly so, while 47.1 per cent. of all strikes were successful, and 15.3 per cent. partly so.

An investigator previously quoted, Mr. Fischer of the New Jersey Bureau of Labor Statistics, truly writes: "As far as my observation extends,— and labor leaders are never tired of asserting it,— the only advocates practically of apprenticeships are the trades-unions, even though their reasons for doing so may be selfish,— the restriction or limitation of the number of journeymen."

The attempt of trades-unions in England to limit apprentices seems to be even feebler than in this country. That acknowledged authority, Mr. George Howell, thus concludes a thorough discussion of the English situation in his *Conflicts of Labor and Capital:*—

> (1) The manifold rules and regulations of trades-unions do not materially interfere with the free admission of apprentices into the several trades of the country. (2) No dearth of workmen is caused in any of these trades by their restrictive action. (3) Apprenticeship is absolutely necessary for the purpose of acquiring a practical knowledge of a trade. Without this there can be no real guarantee for good and efficient workmanship.

It is in this gradually lessening number of trades where apprenticeship is still practicable and necessary for good workmanship, such as glass-working, iron-moulding, printing, hat-making, and some of the building trades, that some of our American trades-unions demand a thorough apprenticeship. This is in every way commendable. In connection with rules which require that the apprentice must spend a certain number of years, usually three to four, in learning his trade, and which protect both the employer and the apprentice during this time, our unions in some cases have other rules restricting the proportion of apprentices to journeymen in each shop. Thus the Horse-collar Makers' National Union allows one apprentice at least to every shop, and one to every seven journeymen, but not over three to a shop. Apprentices serve three years.

The general reasons for restriction of the number of apprentices are two,— to secure a thorough training of those who do try to learn and to keep up or raise wages by limiting the supply of skilled workers in a given trade. The first reason has much force. If an employer can take as many apprentices as he chooses, he will often fill his shop with half-trained boys, and discharge higher-priced adults. Such action is demoralizing in many ways. Only half-trained men would ever be produced by this process.

As for the very few unions which go farther and restrict the number of apprentices beyond the point necessary to secure good training, probably no full defence can be offered; but there is much more excuse for this position than is commonly supposed. The workman is only imitating the trusts and combinations of capital, now so common for restricting output, and with more excuse; for the laborer is in more need of improvement of condition than the capitalist.

As long as there are idle competent workmen in a trade who are willing to work, as is said to be the case in the few very restrictive unions, it is natural to desire to prevent the bringing of others into the trade. The New York Bureau of Labor Statistics in 1886 found that there were then 3,710 apprentices and helpers to 7,599 journeymen printers in 1,255 establishments outside of the large city dailies. "The totals," says the report, "furnish reasons for the unions' attitude in regard to the limitation of apprentices, and make it easier to understand the deep-seated prejudice against the unrestricted employment of boy labor." When a trade is in an overcrowded condition, it might be better in the end for even the would-be apprentice to enter some of the many new industries constantly rising, with increasing wealth and wants. This will be no great hardship, for the children of workers in a trade often prefer another occupation.

I am told by a Philadelphia builder, and by Mr. McGuire of the Brotherhood of Carpenters and Joiners, that by organization and limitation of apprenticeship and admission to the union the bricklayers of Philadelphia have raised their wages within a few years from $1.75 to $3.50 a day. Mr. Hotchkiss, Labor Commissioner of Connecticut, tells the Social Science Association how by similar means the employees of a certain organized industry in his State keep their wages at $3 and $3.50 a day when wages for work of similar difficulty in unorganized industries are only $1.00 to $1.25, without appreciable increase in the price of the finished product. Many students of business conditions hold that nearly, if not quite, as many adults find employment in a trade where wages are high and apprenticeship regulated as where wages are low and any number of helpers are employed. Workmen cannot be expected to wait until the ideally best mode of raising wages is possible. They clutch at the first means offered. Trades-unionists are fond of saying that the professional classes are not in a position to throw stones in this matter; for they limit competition by raising the standard of admission to the bar, medicine, etc. To raise the standard of admission to a trade is declared impracticable, save in a partial degree, through apprenticeship rules. Limitation of number is the only very efficient restriction. But, whatever be the motives of many advocates of higher conditions for admission to the bar, the public would never sanction these conditions save as they produce better men.

Again, the habit of restriction is likely to lead workmen to realize the need of greatly restricting the immigration of those of a low standard of living,— a measure which nearly all American economists believe is of vital importance in elevating American labor.

Finally, we come to a brief consideration of the best way of securing that skilled labor which the apprenticeship system, through no fault of the unions, now fails to give. The only way seems to be through manual training in the public schools, followed by special trade instruction in private or possibly publicly endowed trade-schools. The folly of relying on apprenticeship, even if that were possible, was illustrated in returns from 362 workmen, in over 40 kinds of mechanical and manufacturing industries, published in the Wisconsin Labor Bureau Report for 1887-8. Only 130 report that their employers give sufficient encouragement to the apprentices in their employ, while 232 report a failure of the employers in this matter. A similar failure on the part of the employees is also there reported.

As an interesting illustration of how a trade-school may help to solve the problem of trade instruction, the following quotation is made from the address made by Colonel Auchmuty a year ago before the American Social Science Association: —

> We will take the plumbing trade, one of the most difficult of trades, and one which might more appropriately be called a profession, so varied is the knowledge and so great is the intelligence required. The plumber must know how to work with lead, iron, copper, and brass, and must understand the properties of these metals. He must know, for instance, that lead and iron pipe will not hold together; and, to make a tight connection, a ring or "ferrule" of brass must be inserted. In dealing with lead, he must be able to work sheet-lead in different forms and join two sheets together either with solder or, where a receptacle for acids is wanted, by a process called "lead burning." He must be able to join lengths of lead pipe by what are called "wipe joints." These joints are not easy to make. Let some "handy man" take a cushion in one hand, leaving two fingers loose, lest they may press too heavily on the joint, and hold in the other a ladle of molten solder, and proceed to join two pieces of pipe. He will find he has undertaken a difficult task. Then remember that these joints are made in all sorts of places, on the wall, near the floor, close to the ceiling, also that there are complicated branch joints, and the difficulty of learning how to make them will not seem less. Lead pipe, too, must be bent in various shapes so neatly that the bore is not reduced or the pipe split. The plumber must also know how to join lengths of cast-iron pipe by "caulking" or by "rust joints," according to the purpose for which it is to be used; and he must know how to cut, thread, and bend brass and wrought-iron pipe. Yet all this work can be "listed" under fifteen heads, as follows: 1. Lead seams; 2. Overcast joints; 3. Cup joints; 4, 5. Traps; 6. Horizontal branch joints; 7. Upright wipe joints on pipe placed at various angles; 8. Upright branch joints; 9. Wiping on a stop-cock; 10. Wiping a flange on a two-inch pipe; 11. Wiping on a ferrule; 12. Caulking; 13. Putting in an overflow pipe in a safe waste; 14. Cutting and threading wrought-iron pipe; 15. Bending pipe. At the conclusion of this course, fancy work is done by the more proficient.
>
> When each of these fifteen exercises can be done well, the pupil is ready, so far as his manual skill is concerned, to put up fixtures; that is, to set and connect bath-tubs, sinks, etc., with supply and waste pipes.
>
> But manual skill is only a portion of the qualifications the plumber must possess. Besides being able to join these fixtures and his pipes, he must know how to place them. He is dealing with steam which may scatter destruction and with gases that contain the germ of disease. Common sense would also tell us that this knowledge can be taught better and more surely in a trade-school than it can be learned by observation and experience in a workshop.

The claim of Colonel Auchmuty, as of another teacher of similar work, President Smart of Purdue University, given in 1888 before the National Convention of the Bureaus of Labor Statistics, is that a few months at a trade-school, followed by a few months' experience in actual work, will give any one of eighteen or nineteen years of age a better training than a four years' apprenticeship. In Colonel Richard Auchmuty's School on First Avenue, between 67th and 68th Streets, New York, there were 589 (1890–91) pupils in bricklaying, plastering, plumbing, carpentry, house, sign, and fresco painting, stone-cutting, blacksmith's work, and tailoring. This school has now been running ten years, at a net cost, above tuition fees, of several thousand dollars a year.

The Pratt Institute in Brooklyn had 51 day pupils and 201 evening pupils 1890–91 in its department of mechanic arts opened in February, 1888, where instruction was given in mechanic arts, carpentry, turning and pattern-making, forging, machine work, bricklaying, plastering, plumbing, house and fresco painting. The trade-school of the Philadelphia Builders' Exchange was opened in 1890 with 129 pupils, of whom 61 were in the plumbing department, 31 in bricklaying, and 21 in carpentry. The school graduated 63 in June, 1891, as follows: plastering, 3; painting, 2; stone-cutting, 3; blacksmith's work, 4; carpentry, 14; plumbing, 27; bricklaying, 9.

The Rindge School, lately presented to Cambridge, Massachusetts, and the Williamson Trade-school in Philadelphia, endowed with over $2,000,000, are to be trade-schools, as distinct from manual training schools, where simply general dexterity and education of the whole being through training of the eye and hand are attempted. For thirty years Messrs. Hoe, of printing-press fame in New York, who employ 250 boys, mostly sons of their workmen, have had a night school for them. Then there is the Technical School of the Baltimore & Ohio Railroad Company at Baltimore, an account of which is given in the report of Dr. W. T. Barnard on "Technical Education in Industrial Pursuits." A similar school is said to be maintained by the Pennsylvania Railroad Company at Altoona, Pennsylvania. The Master Plumbers' Association of Philadelphia, Chicago, and Washington support plumbing schools in their respective cities. The number and success of technical and trade schools in Europe are well known. A tanners' chemical school is to be established at Newark, New Jersey, by the Morocco Manufacturing Association. Just as all our States support professional schools for farmers, and some States in the West do the same for lawyers and engineers, so our State may be called on ultimately to support trade-schools for mechanics.

The movement towards industrial schools is evidently on the eve of great growth. What is to be the attitude of trades-unions towards such schools?

The unions are becoming more and more friendly to manual training, but seem to be somewhat suspicious of trade-schools, as likely to lower wages by increase of competition. Yet the opposition is not so great as commonly supposed, and is rapidly changing to support. Undoubtedly, Colonel Auchmuty's School has been much opposed; but it may have been partly due to a faulty method, on his part, of advertising the school as a means of dispensing with high-priced labor. He denies that he has ever thus presented his work; but in the *Century* for January, 1889, he thus wrote: "Living is made dearer, the poor are made poorer, by union rules. In nearly all callings where skilled labor is required, it can safely be asserted that a journeyman receiving $4 a day and working with a trade-school graduate at $2 a day could produce as much as two journeymen now do for $8, a saving in cost of $2,—25 per cent." No wonder that the unionist opposes any such effort to benefit the employer, or the consumer, at the expense of wages. Furthermore, it is sound economic policy for the worker to prefer high wages to merely sharing as part consumer of his products in the cheapness that might result from lower wages. But it is not likely that a general extension of trade-school instruction would in the long run lower wages. Rather, by imparting greater intelligence and skill to the wage-worker, such schools would the better prepare the way for strong trades-unions and increased productiveness.

That this is probable, and that the working classes will indorse manual training when rightly presented to them, is the belief of such able and well-informed labor-leaders as

Messrs. Powderly, Gompers, and McGuire. The following associated press despatch confirmatory of the above strikes my eye as this goes to press: —

> Boston, September 23. An understanding in relation to trade-schools has been arrived at by the Master Builders' Association and the Bricklayers' Union. It is the first instance in the history of the labor movement in New England that a trades-union and an organization of employers have agreed upon this question. Trade-schools are to be established and opened evenings. All regular indentured apprentices are to be given instruction therein. None but regular apprentices shall be allowed to enter these schools. All pupils shall be given instruction in the theory and science of the trade they propose to learn.

Mr. W. H. Rand, of the United States Bureau of Labor Statistics, informs the writer that he believes the reason why European trades-unions now favor trade-schools, as they in fact almost universally do, while in America the majority as yet oppose them or do not actively favor them, is that in Europe the trade-school sessions are usually held at night and attended mostly by journeymen and regular apprentices. This seems to be the idea of the Boston arrangement just noted. As soon as our trade-schools cease to have the flavor among laborers of a capitalistic effort to reduce wages, and assume their rightful place as a means of effecting that very elevation of skill and thorough training which the apprenticeship laws now in vain urged by the workmen are designed to accomplish, a great popular support will come to these schools.

As an illustration of the present attitude of the English trades-unions, one may refer to the resolution of the British Trades-union Congress in September, 1885, which strongly indorsed technical education and trade-schools. Representatives of these British unions, notably Mr. T. C. Barnes, general secretary of the Glass Makers' Association of the United Kingdom, and Mr. George Shipton of the Amalgamated Society of House Decorators and Painters of the London Trade Council, advocated before a recent Parliament Committee even compulsory instruction of boys in their trades by trade-schools. Representatives of trade-schools rendered similar testimony to the friendship of unions. Also in the United States 72 replies, representing 10 trades, expressed in 1886 to the New

York Bureau of Labor Statistics a favorable inclination toward technical trade-schools: 37 replies, representing 13 trades, opposed them. In view of the newness of trade-schools in 1886, and the mistakes and weakness naturally resulting from youth, these replies were most encouraging.

To sum up, we have found no need of any fear lest our trades-unions unduly restrict apprenticeship, for many of the unions do not restrict at all; and, when they do, there are not usually anywhere near as many apprentices as the union rules allow. We have also concluded that technical trade-schools may do a vast deal of good in replacing, as far as the times require, the old-fashioned and now defunct system of apprenticeship, and that the unions are likely, if the manual and trade-school movement is judiciously handled, to come gradually to the approval of these schools.

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